MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.36478/makrjms.2025.1.617.622

Endoscopic Strategies for UGIB: Comprehensive Findings from a Tertiary Care Centre

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ABSTRACT
Acute upper gastrointestinal bleeding (UGIB) remains a significant medical emergency worldwide, with a multifaceted impact on healthcare due to its morbidity, mortality and resource utilization. This study investigates the clinical presentation, endoscopic findings, management strategies and outcomes of UGIB in a tertiary care setting, aiming to provide actionable insights for optimizing care. The study enrolled 101 adult patients presenting with UGIB over 18 months, with symptoms including hematemesis, melena and hemodynamic instability. Early endoscopy (≤24 hours) was performed in 69.3% of cases, enabling timely diagnosis and therapeutic intervention. Variceal bleeding emerged as the predominant etiology (45.5%), followed by peptic ulcer disease (34.6%), Mallory-Weiss tears (1.98%) and malignancy (0.99%). Endoscopic therapy included band ligation (30.7%), injection of adrenaline (5%) and conservative management for 61.4% of cases. These modalities have been widely documented in previous studies as effective approaches for managing UGIB, particularly in resource-limited settings where timely intervention is crucial. Risk stratification using the Rockall score categorized most patients as moderate risk, with a mean score of 3.6. This study utilized the Rockall score to assess both clinical and endoscopic risk factors, a method validated in prior studies for its predictive accuracy in similar UGIB contexts. Adverse outcomes, including rebleeding (1.98%) and mortality (0.99%), were notably low, highlighting the efficacy of early endoscopic intervention and comprehensive management. This study underscores the critical role of early endoscopy in improving UGIB outcomes. It demonstrates that timely intervention, guided by validated risk assessment tools like the Rockall score, can significantly reduce complications and mortality. Further research should explore integrating advanced endoscopic techniques and refining risk stratification models to enhance patient outcomes.

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Key Words
Upper gastrointestinal bleeding, endoscopy, varices, peptic ulcer, rockall score, endoscopic intervention

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Received: 01 December 2024
Accepted: 16 January 2025
Published: 22 January 2025

Citation: Monil Shah, Jay Naik, Akshay Sutaria and Rahul Damor, 2025. Endoscopic Strategies for UGIB: Comprehensive Findings from a Tertiary Care Centre. Res. J. Med. Sci., 19: 617-622, doi: 10.36478/makrjms.2025.1.617.622

INTRODUCTION

Acute upper gastrointestinal bleeding (UGIB) is one of the most frequently encountered medical emergencies worldwide[1]. It encompasses bleeding originating from the esophagus, stomach, or duodenum, presenting clinically as hematemesis, melena, or both[8]. The condition significantly impacts global healthcare systems, with substantial rates of hospitalization, morbidity and mortality, particularly among older adults and individuals with comorbidities[4]. Epidemiologically, UGIB has an annual incidence ranging from 40-150 cases per 100,000 individuals[1,4]. The condition is broadly classified into variceal and non-variceal bleeding, with each category necessitating distinct approaches to management. Variceal bleeding, often associated with portal hypertension due to chronic liver disease, constitutes a major cause of morbidity and mortality in cirrhotic patients[18]. Conversely, non-variceal causes, including peptic ulcer disease, Mallory-Weiss tears and malignancies, require tailored diagnostic and therapeutic strategies[13,15]. Endoscopy has emerged as the cornerstone of UGIB management, enabling direct visualization of the bleeding site, determination of etiology and provision of therapeutic interventions[2]. The advent of advanced endoscopic modalities has significantly transformed the landscape of UGIB treatment, reducing the need for surgical interventions and improving patient outcomes[6]. However, the optimal timing of endoscopy remains a subject of debate, with early endoscopy ($\leq$24 hours) demonstrating clear benefits in several studies but posing logistical challenges in resource -limited settings[2,16]. Despite these advancements, UGIB continues to present diagnostic and therapeutic challenges. Risk stratification tools, such as the Rockall and Glasgow-Blatchford scores, play pivotal roles in guiding clinical decision-making[16,17]. These scoring systems help identify high-risk patients who may benefit from urgent intervention, while sparing low-risk individuals from unnecessary procedures[16]. This study was conducted in a tertiary care center with the aim of evaluating the clinical profile, endoscopic findings and outcomes of patients presenting with UGIB. By analyzing the timing of endoscopic interventions, therapeutic modalities employed and patient outcomes, this study seeks to contribute valuable insights into the management of UGIB in similar settings. The findings of this study are particularly relevant in the context of developing countries, where healthcare resources may be constrained and the burden of UGIB is compounded by risk factors such as alcohol consumption, Helicobacter pylori infection and delayed healthcare access[18]. This study highlights the critical importance of timely endoscopic evaluation and risk-based management strategies, emphasizing the need for a multidisciplinary approach to improve patient outcomes. Furthermore, the study seeks to address gaps in the existing literature by comparing its findings with data from global studies[3,9]. This comparison provides a nuanced understanding of region-specific variations in UGIB etiology, management practices and outcomes, paving the way for targeted interventions and policy formulations aimed at optimizing care for UGIB patients. In the following sections, we detail the study's methodology, results and implications for clinical practice, focusing on the role of endoscopy in the contemporary management of UGIB. This study aims to evaluate the clinical profile, endoscopic findings and treatment outcomes of UGIB in a tertiary care setting[9].

MATERIALS AND METHODS

Methods Study Design and Setting: This prospective observational study was conducted over 18 months, from January 2021 to June 2022, in the Department of General Surgery at Parul Institute of Medical Sciences and Research, Gujarat, India. The study adhered to ethical guidelines, with approval obtained from the institutional ethics committee. Written informed consent was acquired from all participants[1].

Study Population: The study included adult patients (aged $\geq$18 years) presenting with symptoms of acute upper gastrointestinal bleeding (UGIB), such as hematemesis (vomiting of blood) or melena (black tarry stools)[8]. Exclusion criteria included patients with known bleeding disorders, those on anticoagulant therapy with an INR >3 and individuals presenting with hemodynamic instability unresponsive to initial resuscitation measures[16]. Patients who refused consent were also excluded[16].

Sample Size and Sampling Method: A total of 101 patients were enrolled in the study using consecutive sampling[3]. This method ensured the inclusion of all eligible patients presenting during the study period, providing a comprehensive representation of UGIB cases at the tertiary care center[9].

Clinical Assessment and Initial Management: On admission, a detailed clinical history was recorded, including presenting symptoms, comorbidities, use of nonsteroidal anti-inflammatory drugs (NSAIDs) and alcohol consumption[3]. Hemodynamic stability was assessed and initial resuscitation measures, including intravenous fluid replacement and blood transfusion, were administered as required[5]. Hemoglobin levels, platelet count, coagulation profile and renal function tests were performed for all patients[5,10-12].

Endoscopic Evaluation: Upper gastrointestinal endoscopy was performed within 24 hours of admission for most patients, barring those with

contraindications or logistical delays[2,6]. Endoscopic evaluation aimed to identify the source of bleeding, determine the etiology and provide therapeutic intervention when indicated. Therapeutic interventions included:

- Endoscopic variceal ligation (EVL) for esophageal varices[7].
- Injection of adrenaline for bleeding peptic ulcers or Mallory-Weiss tears[13].
- Hemoclips for high-risk peptic ulcers with active bleeding[10].
- Conservative management for patients without active bleeding or those deemed low-risk[9].

Risk Stratification: The Rockall score was calculated for all patients to stratify the risk of rebleeding and mortality[16]. The score incorporated clinical parameters such as age, comorbidities and hemodynamic status, along with endoscopic findings[4].

Data Collection: Detailed records were maintained for each patient, including demographic data, presenting symptoms, clinical and endoscopic findings, interventions performed, transfusion requirements, and outcomes. Adverse outcomes, including rebleeding and mortality, were documented and analyzed[1,2].

Statistical Analysis: Data were entered into a standardized database and analyzed using SPSS software version 25[3]. Continuous variables were expressed as mean±standard deviation, while categorical variables were presented as frequencies and percentages. Comparisons were made using chi-square tests for categorical data and t-tests for continuous data[9]. Statistical significance was set at $p<0.05$[9]. Outcomes were further compared with findings from relevant global studies to conceptualize results[4].

Ethical Considerations: The study followed the principles outlined in the Declaration of Helsinki[1]. Patients were assured of confidentiality and participation was voluntary[16]. Any patient requiring specialized care beyond the scope of the study was referred to appropriate facilities[9].

RESULTS AND DISCUSSIONS

Demographics and Clinical Characteristics: The mean age of the cohort was 53.3 years (range: 18-88), with a male predominance (75.2%). Alcohol consumption (42.6%) and NSAID use (7.9%) were notable risk factors.

Timing of Endoscopy: Early endoscopy (<24 hours) was performed in 69.3% of patients, facilitating prompt diagnosis and intervention.

Etiology of UGIB: The leading cause of bleeding was varices (45.5%), followed by peptic ulcer disease (34.6%). Other causes included Mallory-Weiss tears (1.98%) and malignancy (0.99%). (Fig. 1) illustrates a variceal bleed observed during endoscopy.

Fig. 1: Showing Mallory-Weiss Tear[13]

Fig. 2: Forest 1b Ooze from the Ulcer[11]

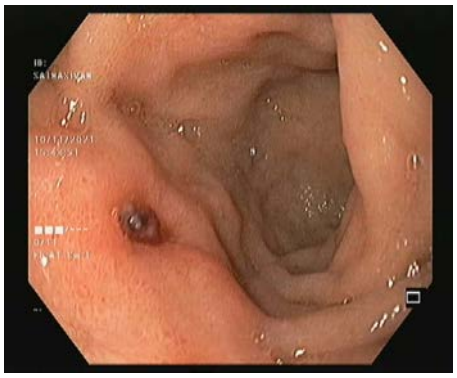

Fig. 3: Shows Dieulofoys Lesion[14]

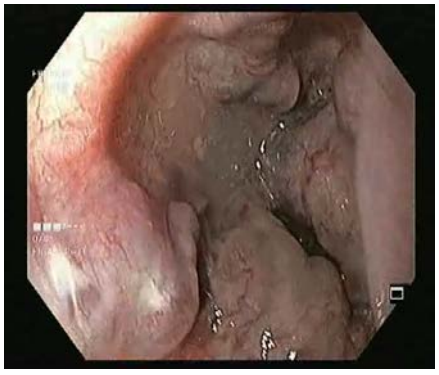

Fig. 4: Showing Grade 3 Esophageal Varices[18]

Endoscopic Interventions: Endoscopic band ligation was the primary intervention for variceal bleeding (30.7%), while injection adrenaline was used in 5% of cases. Conservative management was sufficient for 61.4% of patients.

Endotherapy Comparison: The following table highlights the comparison of endoscopic therapeutic interventions across different studies:

Fig. 5: Endoscopic Variceal Ligation (EVL)[7]

Adverse Outcomes and Comparisons: The present study demonstrated low adverse outcome rates, consistent with other studies, underscoring the role of early endoscopic intervention. Rebleeding was noted in 1.98% of cases in the present study, primarily involving variceal causes, which were managed with repeat endoscopic intervention. Mortality was 0.99%, attributed to an aorto-esophageal fistula. Blood transfusion requirements were observed in 48% of cases, consistent with higher rates in variceal bleeding. This study underscores the critical role of early endoscopy in managing UGIB and highlights region-specific patterns in its etiology, management, and outcomes. The findings demonstrate a predominance of variceal bleeding, which aligns with data from regions where alcohol consumption and chronic liver disease are significant public health challenges. Compared to studies from Western countries, where peptic ulcer disease remains a leading cause of UGIB, the higher prevalence of variceal bleeding in our cohort reflects the influence of geographic and lifestyle factors[9]. The observed rate of variceal bleeding (45.5%) in this study is consistent with findings reported by Bhandary *et al.*, who documented a similar prevalence in a tertiary care setting in southern India[6]. In contrast, studies conducted in Western countries, such as those by Shields *et al.,* have reported a lower incidence of variceal bleeding but higher rates of non-variceal causes, particularly peptic ulcer disease. These differences highlight the importance of tailoring UGIB management strategies to local epidemiological patterns[9]. The mortality rate of 0.99% observed in this study compares favorably with global data, where mortality rates for UGIB range from 2-10%. This low mortality rate may be attributed to the prompt implementation of early endoscopic interventions and the use of validated risk stratification tools like the Rockall score. Lau *et al.* demonstrated that early endoscopy (performed within 24 hours) is associated with reduced mortality and rebleeding rates, findings that are corroborated by our study[2]. Similarly, the rebleeding rate of 1.98% in our cohort is notably lower than the rates reported in studies where delayed endoscopy was more common[5]. The results underscore the importance of adopting a multidisciplinary approach to UGIB management. Early endoscopic evaluation enables the identification and treatment of high-risk lesions, such as actively bleeding peptic ulcers or esophageal varices, thereby reducing the need for surgical intervention and minimizing complications. Moreover, the Rockall score proved invaluable for stratifying patients by risk and prioritizing resources for those most in need[16]. In resource-constrained settings, where the availability of advanced endoscopic tools and trained personnel may be limited, conservative management remains an important component of care. Our study demonstrated that 61.4% of patients could be effectively managed conservatively, underscoring the need for judicious decision-making based on risk assessment. Limitations of the Study While this study provides valuable insights into UGIB management, several limitations should be acknowledged. The single-center design limits the generalizability of the findings to other settings with different patient demographics or healthcare infrastructure. Additionally, the relatively small sample size may reduce the statistical power of subgroup analyses. Another limitation is the observational nature of the study, which precludes causal inference. Although the use of validated scoring systems enhances the robustness of the findings, randomized controlled trials are needed to further explore the impact of early endoscopy and other therapeutic interventions on UGIB outcomes. Future Research Directions Future studies should focus on multicenter collaborations to validate these findings in diverse populations and healthcare settings. Investigating the utility of novel endoscopic techniques, such as endoscopic ultrasound and hemostatic powders, could further enhance the management of UGIB. Additionally, studies exploring the integration of artificial intelligence in risk stratification and endoscopic decision-making hold promise for improving outcomes. The role of preventive strategies, including the eradication of Helicobacter pylori and the use of non-selective beta-blockers in patients with variceal bleeding, should also be examined. Public health initiatives aimed at reducing alcohol

Table 1: Comparison of Causes of Upper GI Bleed

Causes of Upper GI Bleed	Rockall *et al*	Bhandary[9]	Conor Lahiff[7]	Present Study
Peptic ulcer	842 (36.2%)	35.12%	18%	34 (33.6%)
Varices	108 (4.6%)	50.24%	36%	48 (47.5%)
Mallory-Weiss	119 (5.1%)	6.34%	Not mentioned separately	2 (1.98%)
Esophagitis	241 (10.3%)	10.98%	Not mentioned separately	4 (3.9%)
Malignancy	93 (4%)	1.71%	3%	1 (0.9%)

Table 2: Endotherapy Comparison

Endotherapy	Conor Lahiff[7]	Bhandary[9]	Present Study
Inj Adrenaline	30%	10 (2.44%)	5 (4.95%)
Hemoclip	21% (Inj. Adrenaline+Hemoclip)	9 (2.20%)	1 (0.9%)
EVL	43%	119 (29.02%)	31 (30.7%)
Sclerotherapy	-	16 (3.90%)	-
Conservative	78%	263 (64.15%)	62 (61.4%)

Table 3: Adverse Outcome and Comparison

Adverse Outcome	Conor Lahiff[7]	Bhandary[9]	Present Study
Rebleeding	5%	3.6%	1.98%
Mortality	7%	6.1%	0.99%
Blood Transfusion	52%	45%	48%

consumption and improving access to early screening for chronic liver disease may help address the root causes of variceal bleeding.

CONCLUSION

This study highlights the critical importance of early endoscopy and risk-based management in improving UGIB outcomes. By demonstrating low rates of rebleeding and mortality, it underscores the efficacy of timely intervention and the need for a multidisciplinary approach. Addressing the limitations of current practices through targeted research and public health initiatives will be key to further optimizing the care of UGIB patients. This study underscores the critical role of early endoscopy in managing UGIB. The findings reveal a predominance of variceal bleeding, consistent with regional epidemiological trends. Early endoscopic intervention, particularly band ligation, contributed significantly to reducing rebleeding and mortality rates. The study's results align with previous literature, demonstrating that early endoscopy facilitates prompt diagnosis and effective treatment, thereby improving clinical outcomes. Compared to global data, the higher proportion of variceal bleeding reflects region-specific factors such as alcohol consumption.

Clinical Implications: The Rockall score proved invaluable for risk stratification, guiding the decision to prioritize high-risk patients for early intervention[4]. Conservative management remains a viable option for select cases, offering resource efficiency without compromising outcomes.

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